

**Montana Board of Oil and Gas Conservation
Environmental Assessment**

Operator: Whiting Oil and Gas Corporation
Well Name/Number: Christiansen 34-11-6H
Location: SW SE Section 11 T25N R58E
County: Richland, **MT;** **Field (or Wildcat)** W/C (Bakken Horizontal)

Air Quality

(possible concerns)

Long drilling time: No, 20 to 30 days drilling time.

Unusually deep drilling (high horsepower rig): No, triple derrick drilling rig to drill a single lateral Bakken Formation horizontal well test to 20,164' MD/10,361' TVD.

Possible H₂S gas production: H₂S gas production possibility is slight (Mississippian Formations).

In/near Class I air quality area: No Class I air quality area in the area of review.

Air quality permit for flaring/venting (if productive): Yes, DEQ air quality permit required under rule 75-2-211.

Mitigation:

☒ Air quality permit (AQB review)

☐ Gas plants/pipelines available for sour gas

☐ Special equipment/procedures requirements

☐ Other: _____

Comments: No special concerns – using triple derrick drilling rig to drill a single lateral Bakken Formation horizontal well test to 20,164' MD/10,361' TVD. If existing pipeline for gas in the area, associated gas can be gathered or if no gathering system nearby, associated gas can be flared under Board Rule 36.22.1220.

Water Quality

(possible concerns)

Salt/oil based mud: Yes, oil based invert (70/30) drilling fluids will be used on the mainhole. The horizontal lateral will be drilled with brine water. The surface hole will be drilled with freshwater and freshwater drilling fluids (Rule 36.22.1001).

High water table: No, no high water table anticipated in the area of review.

Surface drainage leads to live water: No, closest drainage is and unnamed ephemeral tributary drainage to the Fourmile Creek, about 1/32 of a mile to the north and about 1/4 of a mile to the southeast from this location. Fourmile Creek is about 7/8 of a mile to the northeast from this location.

Water well contamination: None, closest water wells are about 1/8 of a mile to the northwest, about 1/4 of a mile to the southeast, about 1/2 of a mile to the south southwest, about 5/8 of a mile to the southwest, about 3/4 of a mile to the east and about 1 mile to the northwest from this location. Depth of this stock and domestic water wells range from 50' to 1500'. Surface casing hole will be drilled with freshwater and freshwater drilling fluids. (Rule 36.22.1001) Surface casing will be run and cemented to surface from 2000'. (Rule 36.22.1001)

Porous/permeable soils: No, sandy clay soils.

Class I stream drainage: No Class I stream drainages in the area of review.

Mitigation:

☒ Lined reserve pit

- ☒ Adequate surface casing
☐ Berms/dykes, re-routed drainage
☒ Closed mud system
☒ Off-site disposal of solids/**liquids** (in approved facility)
☐ Other: _____

Comments: Reserve pit will be lined with a 14 mil liner, MBOGC minimum is 12 mil liner. 2000' of surface casing cemented to surface adequate to protect freshwater zones and to cover the base of the Fox Hills Formation. (Rule 36.22.1001)

Soils/Vegetation/Land Use

(possible concerns)

Stream crossings: No, stream crossings anticipated into this location.

High erosion potential: Yes possible high erosion potential on cut and fill slopes, moderate cut, up to 17.6' and Moderate fill, up to 15.2', required.

Loss of soil productivity: None, location to be restored after drilling well, if well is nonproductive. If productive unused portion of drillsite will be reclaimed.

Unusually large wellsite: No, a very large wellsite 425'X510' location size designed to accommodate 4 wells from this well pad, Christiansen 34-11-6H, , Christiansen 34-11-5H, Christiansen 34-11-7H and Christiansen 34-11-1H.

Damage to improvements: Slight surface use is cultivated land.

Conflict with existing land use/values: Slight

Mitigation

- ☐ Avoid improvements (topographic tolerance)
☐ Exception location requested
☒ Stockpile topsoil
☐ Stream Crossing Permit (other agency review)
☒ Reclaim unused part of wellsite if productive
☐ Special construction methods to enhance reclamation
☐ Other _____

Comments: Access to location will be over existing county road, #140. An access of 657' will be built off the county road into this location. Oil based invert drilling fluids will be recycled. Completion fluids will be hauled to an authorized Class II Disposal. Drilling cuttings and mud solids will be fly ashed in the lined cuttings pit and buried in the lined cuttings pit with a minimum of 4' of subsoil cover over the top of the cuttings. No special concerns.

Health Hazards/Noise

(possible concerns)

Proximity to public facilities/residences: Nearest residences are about ¾ of a mile to the east, about ¾ of a mile to the southeast, about 7/8 of a mile to the south southwest and about ¾ of a mile to the southwest from the location. The town of Fairveiw, Montana is about 9.9 miles to the southeast. The town of Sidney, Montana is about 15 miles to the south.

Possibility of H2S: H2S potential is slight (Mississippian Formations).

Size of rig/length of drilling time: Triple drilling rig/short 20 to 30 days drilling time.

Mitigation:

- ☒ Proper BOP equipment
☐ Topographic sound barriers

- ☐ H2S contingency and/or evacuation plan
- ☐ Special equipment/procedures requirements
- ☐ Other: _____

Comments: Adequate surface casing and operational BOP should mitigate any problems. (BOP's 5,000 psig annular, pipe and blind rams) Rule 36.22.1014. No concerns.

Wildlife/recreation

(possible concerns)

Proximity to sensitive wildlife areas (DFWP identified): None identified.

Proximity to recreation sites: None identified.

Creation of new access to wildlife habitat: None

Conflict with game range/refuge management: None

Threatened or endangered Species: Species identified as threatened or endangered are the Pallid Sturgeon, Interior Lease Tern, Whooping Crane and Piping Plover. Candidate species are the Greater Sage Grouse and the Sprague's Pipit. MTFWP Natural Heritage Tracker website lists one (3) species of concern. They are the Whooping Crane, Northern Redbelly Dace and the Iowa Darter.

Mitigation:

- ☐ Avoidance (topographic tolerance/exception)
- ☐ Other agency review (DFWP, federal agencies, DSL)
- ☐ Screening/fencing of pits, drillsite
- ☐ Other: _____

Comments: The surface ownership is private cultivated land. There may be species of concern that maybe impacted by this wellsite. We ask the operator to consult with the surface owner as to what he would like done, if a species of concern is discovered at this location. The Board of Oil & Gas has no jurisdiction over private surface lands.

Historical/Cultural/Paleontological

(possible concerns)

Proximity to known sites None identified.

Mitigation

- ☐ avoidance (topographic tolerance, location exception)
- ☐ other agency review (SHPO, DSL, federal agencies)
- ☐ Other: _____

Comments: On private cultivated surface land. There may be possible historical/cultural/paleontological sites that maybe impacted by this wellsite. We ask the operator to consult with the surface owner as to his desire to preserve these sites or not, if they are found during construction of the wellsite. The Board of Oil & Gas has no jurisdiction over private surface lands.

Social/Economic

(possible concerns)

- ☐ Substantial effect on tax base
- ☐ Create demand for new governmental services
- ☐ Population increase or relocation

Comments: No concerns.

Remarks or Special Concerns for this site

A single lateral Bakken Formation horizontal well test to 20,164'MD/10,361'TVD. No concerns.

Summary: Evaluation of Impacts and Cumulative effects

No significant long term impacts expected, some short term impacts will occur.

I conclude that the approval of the subject Notice of Intent to Drill (does/**does not**) constitute a major action of state government significantly affecting the quality of the human environment, and (does/**does not**) require the preparation of an environmental impact statement.

Prepared by (BOGC): \s\ Steven Sasaki

(title:) Chief Field Inspector

Date: May 21, 2013

Other Persons Contacted:

Montana Bureau of Mines and Geology, GWIC website

(Name and Agency)

Water wells in Richland County

(subject discussed)

May 21, 2013

(date)

US Fish and Wildlife, Region 6 website

(Name and Agency)

ENDANGERED, THREATENED, PROPOSED AND CANDIDATE SPECIES MONTANA COUNTIES, Richland County

(subject discussed)

May 21, 2013

(date)

Montana Natural Heritage Program Website (FWP)

(Name and Agency)

Heritage State Rank= S1, S2, S11, T25N R58E

(subject discussed)

May 21, 2013

(date)

Montana Cadastral Website

(Name and Agency)

Surface Ownership and surface use Section 27 T25N R59E

(subject discussed)

May 21, 2013

(date)

If location was inspected before permit approval:

Inspection date: _____

Inspector: _____

Others present during inspection: _____